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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/492,373	01/27/2000	Yuzo Horikoshi	991444	9795

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 09/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/492,373

Applicant(s)

HORIKOSHI ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,6,7,9,10,14-17 and 20-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,6,7,9,10,14-17 and 20-24 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/6/06 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 4, 6-7, 9-10, 14-17, and 21-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1, 14, 16, and 17 have each been amended to recite that the polymer is obtained from “substituted or unsubstituted alkyl acrylate or substituted or unsubstituted alkyl methacrylate wherein substituents are at least one selected from the group consisting of hydroxy, amino, and ammonium substituents”. It is the examiner’s position that this phrase fails

to satisfy the written description requirement under the cited statute since there does not appear to be a written description requirement of the above phrase in the application as originally filed, *In re Wright*, 866 F.2d 422, 9 USPQ2d 1649 (Fed. Cir. 1989) and MPEP 2163.

As support for this amendment, applicants point to page 11, lines 19-27 of the present specification which applicants argue generally describes unsubstituted alkyl, hydroxyl substituted alkyl, amino substituted alkyl, and ammonium substituted alkyl compounds and specifically described hydroxyl, amino, and ammonium substituents. However, there appears to be no such disclosure on page 11, lines 19-27 of the present specification and the examiner has not found any support for this phraseology in the specification as originally filed.

While page 15 of the present specification recites specific monomers comprising hydroxyl, amino, or ammonium groups, i.e. 2-hydroxypropyl-N,N,N-trimethylammonium chloride acrylate, dimethylaminoethyl acrylate, and N,N-diallylmethylammonium chloride, these three specific examples do not provide support for the broad recitation of “substituted or unsubstituted alkyl acrylate or substituted or unsubstituted alkyl methacrylate wherein substituents are at least one selected from the group consisting of hydroxy, amino, and ammonium substituents”. Further, these monomers on page 15 refer to the presently claimed “polymeric monomer with polar group” not the substituted alkyl acrylate or substituted alkyl methacrylate.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1714

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
6. Claims 1, 4, 6-7, 9-10, 14-17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al. (U.S. 6,248,805) in view of Patel et al. (U.S. 5,977,210) and Fujisawa et al. (U.S. 5,997,136).

Nguyen et al. disclose an ink jet ink comprising (i) 0.1-10% polymer which is obtained from 5-95% hydrophobic monomer such as alkyl (meth)acrylate, 5-95% hydrophobic monomer

such as styrene, and 0-30% monomer which has a highly polar functional group including (meth)acrylic acid or vinyl pyridine, (ii) solvent which is liquid at room temperature, and (iii) 0.5-10% colorant which is a dye or pigment wherein the colorant is dispersed in the polymer. The polymer has glass transition temperature of -25 to 110°C and is produced using emulsion polymerization. The ink is printed using an ink jet printer, which would intrinsically possess an ink cartridge to store the ink. It is also disclosed that in one embodiment, the polymer encapsulates the colorant so that the colorant clearly absorbs on or coats the surface of the polymer, however, it is further disclosed that there is no limit to the type of association between the colorant and the polymer. Further, given that all the ingredients are mixed together when forming the ink, is clear that the colorant is intrinsically dispersed in the solvent (col.3, lines 66-67, col.4, lines 39-48 and 52-53 and 63-64, col.5, lines 8-9, 18-20 and 25-34, and col.6, lines 8-20, 26-36, and 46-50, col.7, lines 34-55, col.10, lines 48 and 66, col.13, lines 58-60, col.19, lines 54-61, col.22, lines 8-10, col.26, line 66-col.27, line 15, and col.31, lines 45-48).

Although there is no explicit disclosure in Nguyen et al. that the surfactant covers a surface of the copolymer, given that the surfactant and copolymer are mixed together in Nguyen et al. (see examples), it would have been natural for one of ordinary skill in the art to infer that the surfactant intrinsically covers a surface of the copolymer.

The difference between Nguyen et al. and the present claimed invention is the requirement in the claims of (a) the volume average particle diameter of the polymer, (b) softening temperature of the polymer, and (c) piezo-type ink jet head.

With respect to difference (a), on the one hand, given that Nguyen et al. produces the polymer by emulsion polymerization as presently claimed, it would have been natural for one of

ordinary skill in the art to infer that the polymer intrinsically possesses the same volume average particle diameter as presently claimed, and thus one of ordinary skill in the art would have arrived at the claimed invention.

On the other hand, Patel et al., which is drawn to ink jet inks, disclose the use of polymer having volume average particle size of 0.1-1 micron in order to produce an ink that will not clog the printer nozzles (col.3, lines 14-15 and col.4, lines 57-59).

In light of the motivation for using copolymer having specific volume average particle diameter disclosed by Patel et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use polymer with such volume average particle diameter in the ink of Nguyen et al. in order to produce an ink which will not clog the printer nozzles, and thereby arrive at the claimed invention.

With respect to difference (b), on the one hand, given that Nguyen et al. discloses copolymers identical to those presently claimed, i.e. obtained from the same types and amounts of monomers, it would have been natural for one of ordinary skill in the art to infer that the polymers intrinsically possess the same softening temperature as presently claimed, and thereby arrive at the claimed invention.

On the other hand, Fujisawa et al., which is drawn to ink jet inks, disclose that the softening temperature of polymers utilized in ink jet inks range from 50⁰ -120⁰ C wherein such temperature allows the ink to be heated quickly so that the ink dot is formed before penetration of ink into recording medium occurs so that feathering of the ink on the recording medium is prevented (col.3, lines 13-35).

In light of the motivation for using polymer with specific softening temperature disclosed by Fujisawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use polymer with such softening temperature in the ink of Nguyen et al. in order to produce an ink which does not feather, and thereby arrive at the claimed invention.

With respect to difference (c), Nguyen et al. disclose the use of thermal ink jet printers (col.2, lines 46-52), however, there is no explicit disclosure of the use of printers containing piezo-type inkjet head as presently claimed.

Patel et al., which is drawn to ink jet ink, disclose the equivalence and interchangeability of thermal ink jet printer, as disclosed by Nguyen et al., with piezoelectric ink jet printer, as presently claimed, as devices used to cause droplets of ink to be ejected in an imagewise pattern on a substrate to generate images (col.7, lines 36-43).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use piezoelectric ink jet printer to print the ink of Nguyen et al., and thereby arrive at the claimed invention.

Response to Arguments

7. Applicant's arguments filed 3/6/06 have been fully considered but they are not persuasive.

Specifically, applicants argue that Nguyen et al. is not a relevant reference against the present claims given that there is no disclosure in Nguyen et al. that the copolymer is obtained from 2-hydroxypropyl-N,N,N-trinethylammonium chloride acrylate or N,N-diallylmethylammonium chloride as required in each of present claims 21-25.

The examiner agrees that there is no disclosure in Nguyen et al. that the copolymer is obtained from 2-hydroxypropyl-N,N,N-trimethylammonium chloride acrylate or N,N-diallylmethylammonium chloride which is why there are no prior art rejections against present claims 21-25.

Applicants argue that Nguyen et al. is not a relevant reference against the present claims given that the ink of Nguyen et al. contains solvent that is a mixture of water and organic solvent and that such mixture would inherently dissolve any pigment or dye present in the ink which is in direct contrast to the present claims that require that the colorant is not dissolved in the solvent.

However, while applicants argue that the pigment and water-soluble or water-insoluble dye would dissolve in the water/solvent mixture of Nguyen et al., applicants have provided no evidence to support their position. For instance, there is no evidence that the pigment or water-insoluble dye would dissolve in the ink of Nguyen et al. wherein the amount of solvent is as little as 5%. This is especially significant in light of col.3, lines 66-67 and col.31, lines 45-48 of Nguyen et al. that disclose that the copolymer present in the ink serves to “disperse” the colorant. Additionally, col.5, lines 19-20, col.3, line 67-col.4, line 1, and col.26, line 65-col.27, line 8 of Nguyen et al. discloses that the colorant is dispersed in the copolymer. Thus, it is the examiner’s position that the colorant of Nguyen et al. is not dissolved in the solvent, i.e. water/solvent mixture, and is dispersed in the copolymer as required in the present claims.

Applicants also argue that even if the particles produced in Nguyen et al. are within the presently claimed range of volume average particle diameters, particles under 0.05 μm or over 1 μm can also be produced.

However, given that Nguyen et al. produces polymer by emulsion polymerization as presently claimed, it would have been natural for one of ordinary skill in the art to infer, absent evidence to the contrary, that the polymer does intrinsically possess volume average particle diameter as presently claimed. While applicants argue that particles under 0.05 μm or over 1 μm can be produced, they have offered no evidence to support this position. Further, there is nothing in the scope of the present claims that excludes the polymer from having some particles under 0.05 μm or over 1 μm as long as the volume average diameter falls within the presently claimed range. Additionally, it is noted that, alternatively, Nguyen et al. is used in combination with Patel et al. which explicitly discloses the use of polymer having volume average particle size of 0.1-1 μm as presently claimed.

Allowable Subject Matter

8. Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 25 would be allowable if rewritten in independent form as described above given that there is no disclosure in the “closest” prior art Nguyen et al. (U.S. 6,248,805) that the copolymer is obtained from 2-hydroxypropyl-N,N,N-trinethyl ammonium chloride acrylate or

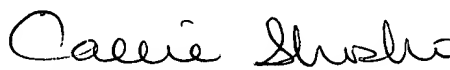
Art Unit: 1714

N,N-diallylmethylammonium chloride which is why there are no prior art rejections against present claims 21-25.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
9/15/06